WHAT IS CLAIMED IS:

1. An optical transmission system, comprising:

an optical transmitter including a non-temperature controlled direct modulation light source, said optical transmitter outputting signal light in a signal wavelength band;

an optical receiver receiving the signal light outputted from said optical transmitter;

an optical fiber transmission line for transmitting the signal light outputted from said optical transmitter as a transmission medium provided between said optical transmitter and said optical receiver, said optical fiber transmission line having a positive chromatic dispersion at an operation wavelength of said direct modulation light source; and

at least one non-temperature controlled dispersion compensator provided on an optical path between the signal outputting end of said optical transmitter and the signal entering end of said optical fiber transmission line,

wherein, at the signal emitting end of said optical fiber transmission line, the accumulated chromatic dispersion at the operation wavelength is set to negative over a temperature range of 0°C to 60°C.

2. An optical transmission system according to claim 1, further comprising a demultiplexer for demultiplexing a plurality of signal channels propagating through said

optical fiber transmission line into one signal channel group in a first wavelength band including a zero-dispersion wavelength of said optical fiber transmission line and the other signal channel group in a second wavelength band,

wherein said dispersion compensator compensates for the accumulated chromatic dispersion in the signal channel group of the second wavelength band, and

wherein, at the signal outputting end of said dispersion compensator, the accumulated chromatic dispersion in one of the signal channels of the second wavelength band passing through said dispersion compensator is negative over the temperature range of 0°C to 60°C.

3. An optical transmission system according to claim 2, wherein, at the signal outputting end of said dispersion compensator, the accumulated chromatic dispersion in all the signal channels of the second wavelength band passing through said dispersion compensator is negative over the temperature range of 0°C to 60°C.

4. An optical transmission system according to claim 2, wherein a bit rate of at least one signal channel among the signal channels included in the second wavelength band is higher than any bit rate of all the signal channels in the first wavelength band.

5. An optical transmission system according to claim 1, wherein said optical fiber transmission line includes a single-mode optical fiber having a zero-dispersion

wavelength of near 1.3 μm.

6. An optical transmission system according to claim 1, wherein said optical fiber transmission line, at a wavelength of 1.38 μm, has a transmission loss smaller than a transmission loss at a wavelength of 1.31 μm.

7. An optical transmission system according to claim 1, wherein said optical fiber transmission line has a zero-dispersion wavelength which exists in a wavelength range of 1.35 μm to 1.5 μm.

8. An optical transmission system according to claim 2, wherein, at the signal receiving end of said optical receiver, the optical power of one of the signal channels in the second wavelength band is higher than the lowest optical power among the optical powers of the signal channels in the first wavelength band.

9. An optical transmission system according to claim 2, wherein, at the signal receiving end of said optical receiver, the optical power of all the signal channels in the second wavelength band is higher than the lowest optical power among the optical powers of the signal channel group in the first wavelength band.

10. An optical transmission system according to claim 1, further comprising pumping light supply means for supplying Raman-amplification pumping light into said optical fiber transmission line, so as to Raman-amplifying the signal light propagating through said optical fiber

transmission line.

11. An optical transmission system according to claim 10, wherein said pumping light supply means supplies the Raman-amplification pumping light of a plurality of pumping channels included in a wavelength range of 1.2 μm to 1.3 μm into said optical fiber transmission line.

12. An optical transmission system, comprising:

an optical transmitter including a non-temperature controlled direct modulation light source, said optical transmitter outputting signal light in a signal wavelength band;

an optical receiver receiving the signal light outputted from said optical transmitter;

an optical fiber transmission line for transmitting the signal light outputted from said optical transmitter as a transmission medium provided between said optical transmitter and said optical receiver, said optical fiber transmission line having a positive chromatic dispersion at an operation wavelength of said direct modulation light source; and

at least one non-temperature controlled dispersion compensator provided on an optical path between the signal receiving end of said optical receiver and the signal emitting end of said optical fiber transmission line,

wherein, at the signal receiving end of said optical receiver, the accumulated chromatic dispersion at the

operation wavelength is set to negative over a temperature range of 0°C to 60°C.

13. An optical transmission system according to claim 12, further comprising a demultiplexer for demultiplexing a plurality of signal channels propagating through said optical fiber transmission line into one signal channel group in a first wavelength band including a zero-dispersion wavelength of said optical fiber transmission line and the other signal channel group in a second wavelength band,

wherein said dispersion compensator compensates for the chromatic dispersion in the signal channel group of the second wavelength band, and

wherein, at the signal outputting end of said dispersion compensator, the accumulated chromatic dispersion in one of the signal channels of the second wavelength band passing through said dispersion compensator is negative over the temperature range of 0°C to 60°C.

14. An optical transmission system according to claim 13, wherein, at the signal outputting end of said dispersion compensator, the chromatic dispersion in all the signal channels of the second wavelength band passing through said dispersion compensator is negative over the temperature range of 0°C to 60°C.

15. An optical transmission system according to claim 13, wherein a bit rate of at least one signal channel among the signal channels included in the second wavelength band

is higher than any bit rate of all the signal channels in the first wavelength band.

16. An optical transmission system according to claim 12, wherein said optical fiber transmission line includes a single-mode optical fiber having a zero-dispersion wavelength of near 1.3 μm.

17. An optical transmission system according to claim 12, wherein said optical fiber transmission line, at a wavelength of 1.38 μm, has a transmission loss smaller than a transmission loss at a wavelength of 1.31 μm.

18. An optical transmission system according to claim 12, wherein said optical fiber transmission line has a zero-dispersion wavelength which exists in a wavelength range of 1.35 μm to 1.5 μm.

19. An optical transmission system according to claim 13, wherein, at the signal receiving end of said optical receiver, the optical power of one of the signal channels in the second wavelength band is higher than the lowest optical power among the optical powers of the signal channels in the first wavelength band.

20. An optical transmission system according to claim 13, wherein, at the signal receiving end of said optical receiver, the optical power of all the signal channels in the second wavelength band is higher than the lowest optical power among the optical powers of the signal channel group in the first wavelength band.

21. An optical transmission system according to claim 12, further comprising pumping light supply means for supplying Raman-amplification pumping light into said optical fiber transmission line, so as to Raman-amplify the signal light propagating through said optical fiber transmission line.

22. An optical transmission system according to claim 21, wherein said pumping light supply means supplies the Raman-amplification pumping light of a plurality of pumping channels included in a wavelength range of 1.2 μm to 1.3 μm into said optical fiber transmission line.